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Coordinate-space calculation of isospin breaking corrections to the hadronic vacuum polarization contribution to (g-2)_\mu

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As several lattice collaborations agree on the result for the window quantity of the hadronic vacuum polarization (HVP) contribution to (g-2)_\mu, whilst being in tension with the calculation using the dispersive approach, further effort is needed in order to pin down the cause for this difference.
Here we investigate the isospin breaking corrections to the leading order HVP. In many lattice applications, the photon propagator is treated stochastically; however, by analogy with the hadronic light-by-light contribution (HLbL) to (g-2), we apply a coordinate-space approach to the HVP at NLO. We present a calculation of the two diagrams of the (2+2) topology at unphysical pion mass, where we apply a Pauli-Villars regularization for the photon propagator in the diagram that is UV-divergent. We compare the UV-finite diagram to the pseudoscalar exchange contributions.

Topical area

Quark and Lepton Flavor Physics

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